PRELIMINARY REPORT OF THE COMMITTEE ON BIRD MIGRATION.

BY C. HART MERRIAM, M. D.

OWING to the large quantity of material in possession of the Committee on Bird Migration, the several superintendents, with two exceptions, have been unable to complete the reports for their respective Districts. Hence it is impossible, at this time, to do more than call attention to the extent of the work of the Committee, and to present a few brief examples of the results thus far attained. Any attempt, on the part of the Chairman, to generalize upon the as yet meagre amount of classified data at his command, would obviously be premature.

It is unnecessary to dwell upon the labor involved in the distribution of six thousand circulars, by which means the Committee has secured the co-operation, in addition to the keepers of lights, of nearly seven hundred observers, of which number twenty-five are women—and very excellent observers they make. These observers are distributed as follows: Mississippi Valley District, Prof. W. W. Cooke, Superintendent, 150; New England District, John H. Sage, Superintendent, 144; Atlantic District, Dr. A. K. Fisher, Superintendent, 128; Middle-Eastern District, Dr. J. M. Wheaton, Superintendent, 92; Quebec and Maritime Provinces, Montague Chamberlain, Superintendent, 56; District of Ontario, Thomas McIlwraith, Superintendent, 38; Pacific District, L. Belding, Superintendent, 40; Rocky Mountain District, Dr. Edgar A. Mearns, Superintendent, 15; Manitoba, Prof. W. W. Cooke, Superintendent, 10; British Columbia, John Fannin, Superintendent, 5; North-West Territories, Ernest E. T. Seton, Superintendent, 5; Newfoundland, James P. Howley, Superintendent (returns not yet received).

Through the courtesy of the Hon. Wm. Smith, Deputy Minister of Marine and Fisheries of Canada, and of Commander Henry F. Picking, U. S. N., Secretary of the Lighthouse Board of the United States, the Committee has secured the co-operation of these departments, which, it is hardly necessary to add, is indispensible to the success of the undertaking. The Department of Marine and the Lighthouse Board have distributed over one

thousand sets of blank schedules and circulars to the lighthouses, lightships, and beacons of the United States and British North America. Several hundred of these schedules have already been returned to the Committee, and almost every mail brings one or more. A large number of the heads and wings of birds which dash themselves against the lights have been sent to the Chairman for indentification. Among them is one of the rarest of North American birds — Swainson's Warbler (*Helonæa swainsoni*) — which was kindly forwarded by the keeper of the lighthouse at Sombrero Key. The schedules entitled "Birds striking the Light" contain data of an exceptionally valuable character, and throw much light on several problems not within reach of the ordinary observer.

The Committee has now established observation stations in every State in the Union, and in every Territory, excepting Nevada; and it is gratifying to know that returns have already been received from nearly one thousand observers. Comparatively few of these observers are ornithologists, or even bird collectors, the great bulk being intelligent farmers, tradesmen, and light-keepers. Those who know only the commonest birds, such as the Robin, Bluebird, or Chimney Swift, can contribute data of great value, and their services are eagerly sought.

The area over which the observation stations are scattered is co-extensive with the boundaries of the inhabited portions of the North American Continent. In the East, the southernmost station from which returns have been received is Sombrero Key, off Southern Florida (latitude 24° 37′); and the northernmost, Belle Isle, off Labrador (latitude 51° 53′). In the West, reports have come to hand from Arizona and Southern California, and from Point Barrow, the most northerly point of Arctic Alaska (latitude 71° 18′). The easternmost station from which data have been received is St. John's, Newfoundland (west longitude 52° 45′), projecting well into the Atlantic; while on the Pacific the Committee has observers at various points in California, Oregon, Washington, and British Columbia.

Hence it appears that the migration stations of the American Ornithologists' Union are sprinkled over 46° 41′ of latitude (approximately three thousand two hundred miles in a north and south direction), and 72° 15′ of longitude (approximately three thousand five hundred miles in an east and west direction). The

distance in a straight line between the most remote points (Sombrero Key and Point Barrow) is about four thousand three hundred miles.

The amount of material now on hand is so great that the Committee cannot hope to fully elaborate it without considerable pecuniary assistance. Reports on the Robin (*Merula migratoria*), Catbird (*Mimus carolinensis*), Martin (*Progne subis*), Baltimore Oriole (*Icterus galbula*), and Nighthawk (*Chordeiles popetue*), have already been prepared by the superintendents of the districts east of the Rocky Mountains, and were presented at the last Congress of the Union.

At the end of this article will be found a summary of the records of the Martin, together with Professor Cooke's report on the northward movement of the Baltimore Oriole in the Mississippi Valley.

Mr. John Murdoch, Superintendent of Alaska, has completed a very interesting report upon the times of arrival and departure of the species that visit Alaska, supplementing his personal observations (which will be found appended to the present paper) by the published records of previous explorers.

The most valuable report yet received is that of Mr. L. Belding, Superintendent of the Pacific District. It contains notes on no less than two hundred and eighty species, and is such an important contribution to the ornithology of our western coast that the Committee hopes to publish it in full at an early date.

Professor Cooke's report for the Mississippi Valley will soon be ready for printing, and contains a vast amount of useful information. In addition to the report proper, consisting of original notes on three hundred and eighty-three species (which fills about four hundred pages of foolscap), there is a supplemental annotated list of one hundred and twenty-six species which have been found in the Mississippi Valley, but which have not as yet fallen under the notice of the Committee's observers. The total of birds known to visit the Mississippi Valley is thus increased to the surprising number of five hundred and nine species. But this by no means concludes the report, for Professor Cooke also traces the 'bird-waves,' treats of the rate of speed at which certain species migrate, and gives a tabulated statement of the contemporaneous phenomena observed. Furthermore, the report will be accompanied by weather maps, prepared by the able

hand of Mr. Otto Widmann, with explanatory text by Professor Cooke.

The Mississippi Valley—a mighty river basin penetrating the heart of a great continent from a semi-tropical climate on the South well into the cold-temperate regions of the North, and unobstructed by mountain barriers or large bodies of water to deflect the current of bird life from the smooth channel through which it flows, yet sufficiently diversified to present a variety of minor physiographical conditions—affords peculiar facilities for the study of many phases of bird migration, and is well worthy of the labor bestowed upon it in this report.

The Chairman takes pleasure in announcing two additions to the personnel of the Committee. Mr. William Dutcher has been appointed Superintendent of Long Island, New York, in which district he has for several years been successfully at work. The readers of 'The Auk' are already familiar with some of the results of his investigations, but the greater portion is still unpublished.

Mr. Lyman S. Foster has been appointed Superintendent of the Lighthouse District of Spanish America, and has already brought together a large amount of valuable material. Mr. Foster began the collection of data from this source independently of the Committee. On the 25th of April, 1884, he mailed a circular-letter, inclosing return blanks, to the keepers of two hundred and fifty-five lighthouses in the West Indies, Central, and South America. The responses were so numerous and satisfactory that, on the 25th of July, he mailed a second letter, containing more detailed instructions, and accompanied by a little book, in the Spanish language, as a guide to the keepers in their ornithological investigations. A very voluminous polyglot correspondence followed, and is still progressing. It was ascertained that large numbers of birds are annually killed by striking the lighthouses on both coasts of South America and in the West Indies—particularly along the northern coast of Cuba. Florentina Alvares, keeper of the lighthouse at Paredon Grande, Cuba, picked up more than a hundred birds one morning. Pedro Maury reports that two hundred and seventy-eight birds killed themselves against the lighthouse near Cardenas during the night of October 4-5, 1884. Francisco Megide writes from Bahia de Cadiz, "one night an infinity of birds struck, and the

tower men utilized them for food." Francisco Bautista states that at San Antonia from five to six hundred birds have been picked up in a single morning.

From seven lighthouses upon the northern coast of Cuba Mr. Foster has received much confirmatory evidence of the fact, clearly pointed out by Professor Baird nearly twenty years ago, that in autumn an immense bird-wave reaches the Cuban shores from Florida—a movement which renders insignificant the migration from Florida westward along the northern coast of the Gulf of Mexico.*

MIGRATION OF THE MARTIN (*Progne subis*) IN THE SPRING OF 1884.

The common Purple Martin is an excellent species by which to trace migration, for it is well-known and widely distributed, and its habit of occupying boxes erected for its use in towns and villages renders its movements far easier of observation than in the case of forest-dwelling birds. In winter the Martin visits South America, but the last of the fall migrants rarely leave our southern border before December. Returning, the advance guard usually enters the Gulf States toward the latter part of February. During March the great army arrives and spreads over the whole of the Southern States, the van appearing in many parts of Virginia, Kentucky, Southern Illinois, Missouri, and Kansas, some enterprising individuals reaching even as far north as latitude 40°. If not retarded by cold, the first week of April finds them pushing swiftly northward, and by the end of the month they have distributed themselves over nearly the whole of the United States east of the Rocky Mountains, and are already common in some parts of Canada. The exact time of their appearance at any given locality in the Northern States varies as much as two weeks from year to year. During the spring of 1884 they were recorded from Water Valley, Miss., March 1; Gainesville, Texas, March 5; Caddo, Indian Territory, and Newport, Arkansas, March 9; St. Louis, Mo., March 24; Manhattan, Kansas, March 25; Southern Iowa, March 30. During April they move through Northern Illinois and parts of Wisconsin and Minnesota, arriving at latitude 45° about the end

* The full results of Mr. Foster's investigations, including notes on one hundred and fifty species, were presented before the Linnæan Society of New York, September 21, 1884.

of the month. May 19 they reached Portage la Prairie in Manitoba. East of the Mississippi Valley they were seen in Jessamine County, Kentucky, March 18; at Buffalo, West Virginia, March 22; Camden, Indiana, March 28; New Lexington, Pa., April 16; Columbus, Ohio, April 15; Niagara Falls, April 18; Auburn, New York, April 20; Belleville, Ontario, April 22; Ottawa, Canada, April 27. In New England the returns show them at Saybrook, Conn., April 19; Greenfield, Mass., April 27; Moosehead Lake, Maine, April 23. They were seen at St. John's, New Brunswick, May 2; Chatham, N. B. (Mirimichi Bay, facing the Gulf of St. Lawrence), May 10; and at Cape Breton Island, north of Nova Scotia, June 1.

Turning now to the other side of the Continent, their progress is found to have been much affected by the unfavorable weather. In California Mr. L. Belding has records from San Diego, April 28; Stockton, March 1; Marysville, March 17; Poway, May 1; San José, May 3; Olema, May 8; and Chico, May 22.

Migration of the Baltimore Oriole (*Icterus galbula*) in the Mississippi Valley During the Spring of 1884.

By W. W. Cooke.

The first record we have of this species is April 7, when it appeared at Rodney, Mississippi, latitude 31° 52′; and the last, May 25, at Oak Point, Manitoba, latitude 50° 30′. This would make an average speed of twenty-seven miles a day. As we found last year that the Oriole was a bird of quite uniform speed, let us trace the record this year and see how it agrees. St. Louis, Mo., latitude 38° 40′, is reached April 26, which would be at the rate of twenty-five miles a day, but if we go directly north we find a record on the 25th at Hillsborough, Illinois, latitude 39° 12′, which would make a speed of just twenty-seven miles a day. About April 29 and 30 there seems to have been much movement of this species; not so much the advance of the van as the filling up of the country already traversed, bringing the bulk to the country from latitude 39° 30′ southward and the van to latitude 41°, and in the west to Manhattan, Kansas, latitude 39° 12′. At twenty-seven miles a day they should have advanced by May 6 to about latitude 43° 30′. Now we have to hunt for records of this advance. May 5 and 6 are days of

especial movement in Iowa, Minnesota, Illinois, and Wisconsin. During these days there are records of 'first' all over Northern Illinois and Southern Wisconsin to latitude 43° 16′, with a stray one at latitude 44° 22′ in Wisconsin; and the State of Minnesota shows records up to latitude 43° 43′, with an extra advance along the Mississippi River to latitude 44° 32′. May 12 should have found them at latitude 46°, and we are furnished the record of its appearance at latitude 45° 25′ and 46° 33′ in Minnesota, so that although there are slight variations in speed, as would be expected, the species shows quite a remarkable uniformity in its rate of migration throughout this long distance. There is, however, no trace of the increase of speed from the south northward which was noticed last year; the highest rate being in the middle districts the first week in May. In the prairie region the records are somewhat late, the birds reaching latitude 39° 12′ in Kansas April 30, latitude 40° 53′ in Nebraska May 9, and latitude 44° 21′ in Dakota May 22. Farther west, and almost at the extreme limit of its western dispersion, it was observed at Gainesville, Texas, and Ellis, Kansas.

The full record at St. Louis is: April 26, first, three males at stand, calling. April 28, bulk of males arrive (the bulk of the species averages in all the notes about four days behind the first). May 3, first female (the average for females is about seven days behind the first, and as the arrivals of bulk may be separated into two series, one of about two or three days in the rear, and the other of seven or eight, it is evident that the first series indicates the arrival of the bulk of the males, while the second indicates the increase of the species as a whole, caused by the arrival of the females). May 5, bulk of females arrives, and many transients, making this day the height of the season (as has already been stated, this day and the next are *the* days of movement for this species, and that, too, apparently over an immense country, stretching from latitude 34° to latitude 44°). May 10, first male of last year; May 11, species very much excited, and transient birds of last year present. May 31, set found of six incubated eggs.

[East of the Mississippi Valley this species was reported from Jessamine County, Kentucky, April 18; Camden, Ind., April 24; College Hill, O., April 27; Columbus, O., April 28; Petersburg, Mich., April 30; Cleveland, O., and Battle Creek, Mich.,

May 1; New Lexington, Pa., April 28; Brooklyn, Pa., May 6; Long Island City, and Sing Sing, N. Y., May 2; Lockport, N. Y., May 4; Painted Post, N. Y., May 5; Locust Grove, and Auburn, N. Y., May 6; Watertown, N. Y., May 11; Lake George, and Hammondville, N. Y., May 13; London, Ont., May 8; Hamilton, Ont., May 9; Ottawa and Listowel, Ont., May 13; Portland, Conn., May 2; East Hartford, Conn., May 4; Holyoke, Mass., May 6; Greenfield, Mass., and Hanover, N. H., May 15; Thetford, Vt., May 10; Waterboro, Fryeburg, and Brewer, Me., May 16; Moosehead Lake, Me., and Montreal, Canada, May 24. The Baltimore Oriole is rather a late comer, usually waiting for settled weather before venturing northward. Hence its progress, being subject to comparatively few interruptions, is much more regular than in those species which migrate earlier.—C. H. M.]

Bird Migration at Sombrero Key, Florida. By C. Hart Merriam, M. D.

The southernmost station in the United States from which the Committee has received returns is Sombrero Key, one of the Florida Reefs, in latitude 24° 37′. The lighthouse stands on iron piles, over a sunken reef, and bears a fixed white light of the first order, which is one hundred and forty-four feet above sea-level, and is visible eighteen miles in clear weather. The keeper, Mr. M. E. Spencer, has taken great pains to supply the Committee with reliable data, and has sent several packages of heads and wings for identification. His report, owing both to the absolute trustworthiness of the data it contains (examples of every species mentioned having been seen by the Chairman), and to the geographical position of the station, may fairly be regarded as the most valuable of the lighthouse returns thus far received. It is given in full below.

Mr. Spencer states that more birds are killed by striking the iron framework and cylinder of the tower than by striking the lantern, and that the numbers killed must be far greater than found, because they seldom strike except on dark, stormy nights, when the wind naturally carries the greater number into the surrounding water, there being no land on the reef. He also says that many birds are seen fluttering for a few minutes in the rays of the light and then fly away, without striking.

List of Birds which struck the Lighthouse at Sombrero Key, Florida Reefs, from April 29 to September 25, 1884. By M. E. Spencer, Keeper.

Name of bird.	Date and hour of striking.	No. of Birds striking glass of Lantern.		Direction and force of Wind.	Weather.	Remarks.
		Striking.	Killed.			
Dendrœca striata	Apr. 29, 3 A.M.	2	1	S. E. Fresh	Clear	♂
Siurus auricapillus	" " 2 "	2	1	" "	"	
Dendrœca striata	May 1, 1 "	1		E. Moderate	"	
" "	" 2, 1 "	1		E. Fresh	"	
Setophaga ruticilla	" 2, 2 "	1		" "	"	♀
Dendrœca striata	" 3, 3 "	1	1	E. Moderate	Cloudy	♀
Setophaga ruticilla	Aug. 6, 10 P.M.	4		S. W. Squall	Rain	♀ & ♂ [the air."
" "	" 14, 2 A.M.	16	9	E. S. E.	"	♂ & ♀ "Many birds in
Dendrœca striata	" 14, 2 "	3	2	"	"	" "
" "	" 19, 10 P.M.	2		"	"	
Setophaga ruticilla	" 19, 10 "	3		"	"	♀
Other small birds, unknown	" 19, 10 "	4	1	"	"	
Setophaga ruticilla	" 20, 2 A.M.	5	2	E.	Cloudy	♂ & ♀
Unknown	" 20, 2 "	3	2	"	"	
Setophaga ruticilla	" 21,	1		"	"	♂
Siurus motacilla	" 21,	1	1	"	"	
" "	" 29, 1 A.M.	1	1			
Parula americana	Sept. 7, 1 "	1		S. E. Moderate	Clear	
" "	" 8, 3 "	2	1	N. E.	Rain; squally	
Dendrœca striata	" 8, 3 "	1		"	" "	
Parula americana	" 10, 9 P.M.	6		S. Light	Cloudy	
Other small birds, unknown	" 10, 9 "	4		" "	"	
Siurus motacilla	" 10, 10 "	1		" "	"	
Cardinalis virginianus	" 10, 10 "	1		" "	"	
Parula americana	" 12, 8 "	1		Calm	Clear	
" "	" 14, 8-10 "	8		N. E. Fresh	Rain; squally	
Setophaga ruticilla	" 14, 8-10 "	20	6	" "	" "	♂ & ♀

Name of bird.	Date and hour of striking.	No. of Birds striking glass of Lantern. Striking.	Killed.	Direction and Force of Wind.	Weather.	Remarks.
Dolichonyx *oryzivorus*	Sept 14, 8-10 P.M.	1	1	N. E. Fresh	Rain; squally	
Helonæa swainsoni	" 14, 8-10 "	10	2	" "	" "	
Dendrœca cærulescens	" 14, 8-10 "	4	2	" "	" "	♀
Mniotilta varia	" 14, 8-10 "	3	2	" "	" "	♂
Geothlypis trichas	" 14, 8-10 "	2	1	" "	" "	
Dendrœca discolor	" 14, 8-10 "	1	1	" "	" "	♂
Siurus motacilla	" 14, 8-10 "	200 or more	25	" "	" "	
Dendrœca cærulescens	" 15, 9-12 "	25	10	" "	" "	♂ (also a few ♀)
Parula americana	" 15, 9-12 "	20	8	" "	" "	
Setophaga ruticilla	" 15, 9-12 "			" "	" "	About as many of each struck as on the previous night, but more were killed or else fewer blown away. Less struck of *Siurus motacilla*.
Dolichonyx oryzivorus	" 15, 9-12 "			" "	" "	
Helonæa swainsoni	" 15, 9-12 "			" "	" "	
Mniotilta varia	" 15, 9-12 "			" "	" "	
Geothlypis trichas	" 15, 9-12 "			" "	" "	
Dendrœca discolor	" 15, 9-12 "			" "	" "	
Siurus motacilla	" 15, 9-12 "			" "	" "	
Dendrœca cærulescens	" 17, 12-4 "	10	2	E. Moderate.	Misty	♂
Parula americana	" 17, 12-4 "	100	15	" "	"	
Setophaga ruticilla	" 17, 12-4 "	7	1	" "	"	♂ & ♀
Mniotilta varia	" 17, 12-4 "	3		" "	"	♂
Helmitherus vermivorus	" 17, 12-4 "	1	1	" "	"	
" "	" 21, 8-10 "	40	8	E. S. E.	Rain; squally	
Porzana carolina	" 21, 8-10 "	2	2	"	" "	
Parula americana	" 21, 8-10 "			"	" "	
Setophaga ruticilla	" 21, 8-10 "			"	" "	♂ & ♀
Siurus motacilla	" 21, 8-10 "	40	7	"	" "	
Helonæa swainsoni	" 21, 8-10 "			"	" "	
Dendrœca cærulescens	" 21, 8-10 "			"	" "	♀
A scatttering assortment	" 22, 2-4 A.M.	23	4	E. Fresh	Rain	
Parula americana	" 25, 1-4 "	38	8	S. E. "	Rain; squally	
Scattering varieties	" 25, 1-4 "	50	10	" "	" "	

Since the above went to press I have received from Mr. Spencer another schedule. It contains fifty additional records, and supplements the above list by three species—*i.e.*, *Coturniculus passerinus*, *Melanerpes erythrocephalus*, and *Ionornis martinica*.

BIRD MIGRATION AT POINT BARROW, ARCTIC ALASKA.

By JOHN MURDOCH.

From Observations made at the United States Signal Station Ooglaamie, in North Latitude 71° 18′, from Sept. 1881, till Aug. 29, 1883.

Species.	FIRST SEEN.		LAST SEEN.		
	1882.	*1883.*	*1882.*	*1883.*	
1. Saxicola œnanthe	May 19		May 22		Rare
2. Cotile riparia	July 29		Aug. 10		"
3. Ægiothus canescens exilipes	June 13		July 3		"
4. Plectrophanes nivalis	Apr. 9	Apr. 19	Sept. 20		Plenty
5. Centrophanes lapponicus	May 20	May 23	Sept. 4		"
6. Zonotrichia gambeli intermedia	Sept. 4				Very rare
7. Junco hyemalis			May 24		" "
8. Nyctea scandiaca	Resid't				Rare
9. Hierofalco gyrfalco sacer	"				"
10. Lagopus albus	"				"
11. Lagopus rupestris	"				"
12. Strepsilas interpres	June 12	June 12	Aug. 29		Plenty
13. Squatarola helvetica	June 21				Rare
14. Charadrius dominicus	May 21	May 24	Aug. 28		Plenty
15. Macrorhamphus griseus scolopaceus	June 19	June 28	Aug. 17		"
16. Tringa canutus	June 11	May 30	July 5		Rare
17. Actodromas maculata	June 15	May 30	Sept. 6		Plenty
18. Actodromas fuscicollis		June 6		July 6	Very rare
19. Actodromas bairdi	May 30	May 29	July 6	Aug. 12	Plenty
20. Pelidna alpina americana	May 31	May 29	Sept. 7		"
21. Pelidna subarquata		June 8			Very rare
22. Ereunetes pusillus	July 29	July 25	Aug. 18	Aug. 15	Plenty
23. Limosa lapponica novæ-zealandiæ	Aug. 12	Aug. 11	Aug. 18		Rare
24. Tryngites rufescens	June 8	June 6	July 2	July 27	Plenty
25. Numenius borealis	May 20		July 6		Rare
26. Phalaropus fulicarius	June 4	May 30	Oct. 10		Plenty
27. Lobipes hyperboreus		June 11			Rare
28. Grus canadensis		June 2		June 20	"
29. Chen hyperboreus albatus	May 16	May 5	June 23	Aug. 15	Plenty
30. Anser albifrons gambeli	May 16	May 25	Aug. 18	July 18	"
31. Bernicla nigricans	June 13	June 7	Sept. 21		"
32. Dafila acuta	June 18	July 26	Sept. 7	Aug. 12	Rare
33. Harelda glacialis	May 18	May 24	Oct. 9		Plenty
34. Polysticta stelleri	June 5	June 11	Aug. 3	Aug. 16	"
35. Lampronetta fischeri	May 29	May 26	June 18	(Aug. 24)	Not plenty
36. Somateria v-nigra	May 16	May 19	Aug. 18		Plenty
37. Somateria spectabilis	Apr. 27	May 5	Dec. 2		"
38. Pagophila eburnea	May 22		Oct. 10		Rare
39. Larus glaucus	May 11	Mar. 29	Nov. 1		Plenty
40. Rhodostethia rosea	Sept. 10		Oct. 9		"
41. Xema sabinei	June 2	June 6	Aug. 3	(Oct. 22, '81)	"
42. Sterna macrura	June 10	June 10	Aug. 25		"
43. Stercorarius pomatorhinus	June 24	June 6		Aug. 15	Not rare
44. Stercorarius crepidatus	July 5	May 30	July 7	Aug. 12	" "
45. Stercorarius parasiticus	May 31	May 29	Aug. 27	Aug. 5	Plenty
46. Colymbus adamsi	May 15	May 25	July 30	Aug. 28	"
47. Colymbus pacificus	June 4	June 13	Sept. 28	(and later)	"
48. Colymbus septentrionalis		June 5	Aug. 15	Aug. 16	"
49. Uria grylle	Aug. 14			Feb. 3	Not plenty
50. Lomvia arra	May 22	July 7	Dec. 9		Rare

The Station was abandoned on August 29, 1883, so that dates of departure for species which remained later than this date are unknown.

BIRD MIGRATION AT THE STRAITS OF MACKINAC. BY C. HART MERRIAM, M. D.

DATA resulting from a single season's observations seem to indicate that the Straits of Mackinac lie in the line of a somewhat remarkable avenue of migration. It is probable that the great bulk of those birds which, on their way to the upper peninsula and Canada, pass between the west end of Lake Erie and the southernmost point of Lake Michigan, cross the Straits of Mackinac. The southern peninsula of Michigan, with a narrow strip from the northern borders of Ohio and Indiana, may be regarded as a great wedge with a base two hundred miles in length. Birds entering this wedge are apt to follow it northward, hemmed in on the east by Lake Huron, and on the west by Lake Michigan, till they arrive at its apex, at Mackinac. Hence it appears, in the spring migration, that the Canada-bound birds which, between the south end of Lake Michigan and the west end of Lake Erie are spread over a tract two hundred miles broad, are gradually condensed, so to speak, during their northward passage, till, in crossing the Straits of Mackinac, they occupy a belt but a few miles in width.

It must not be understood that all the birds which cross the base line between lakes Michigan and Erie, and enter the Michigan wedge, pass out at the Straits. From this total must be subtracted all those that breed in the southern peninsula—over an area of forty-one thousand, six hundred square miles—and those (a far smaller number) that migrate by other channels. The remainder, constituting the great bulk of the northern peninsula and Canada-bound individuals, cross at or near Mackinac. It is evident, therefore, that stations located in this vicinity possess unusual facilities for the study of successive bird-waves; and that the keepers of lights in these waters can, with little trouble, furnish the Committee with information of the utmost value.

Spectacle Reef, in Lake Huron, lies just east of the entrance of the Straits, and about midway between shores. The light-house rises directly from the water and is surrounded by a wooden pier ninety-five feet square. The light is of the second order and shows alternately a red and white flash every 30 seconds. It is eighty-six feet above sea-level and is visible, in clear weather,

at a distance of sixteen and one-half miles. The keeper of this light, Mr. William Marshall, has been there seven years. He states that during the migrations, in misty and rainy nights, large numbers of birds strike. On a single morning he has picked up one hundred and fifty on the pier surrounding the tower, and thinks that ten times as many as lodge on this narrow platform fall into the water. A package of specimens which he was kind enough to send the Committee for identification, early in June last, contained the following species: *Regulus calendula* (♂), *Dendræca castanea* (♀), *Dendræca maculosa* (♂ and ♀), *Dendræca cærulescens* (♂ and 2 ♀), *Geothlypis trichas* (2 ♂ and ♀), *Geothlypis philadelphia* (♀), *Helminthophila peregrina* (♂), *Myiodioctes canadensis* (♂), *Siurus aurocapillus*, *Vireo philadelphicus* (3), *Vireo solitarius*, *Vireo olivaceus*, *Zonotrichia albicollis* (2), *Zonotrichia leucophrys* (♂), *Passerculus savanna*, *Melospiza lincolni*, *Contopus virens*, *Empidonax flaviventris* (2).

Mr. James Davenport, keeper of the light at McGulpin's Point, near the western entrance of the Straits of Mackinac, has also furnished the Committee with valuable information.

SWAINSON'S WARBLER.

BY WILLIAM BREWSTER.

SWAINSON'S WARBLER was discovered in 1832 near Charleston, South Carolina, by the Rev. John Bachman. His experience, as quoted by Audubon—who named the species and made it the type of a genus *Helinaia*—is as follows:* "I was first attracted by the novelty of its notes, four or five in number, repeated at intervals of five or six minutes apart. These notes were loud, clear, and more like a whistle than a song. They resembled the sounds of some extraordinary ventriloquist in such a degree, that I supposed the bird much farther from me than it really was; for after some trouble caused by these fictitious notes, I perceived it near to me, and soon shot it.

* Birds of America, Vol. II, p. 84.